

Women Participation in NGOs' Environmental Awareness and Water Resources Management Programmes in Cross River State, Nigeria

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Abstract

The main thrust of this study was to investigate the relationship between women participation in Non-Governmental Organizations' (NGOs) environmental awareness and sustainable water resources management in Cross River State, Nigeria. A null hypothesis was formulated and tested at .05 level of significance. Literature review was carried out according to the variables of the study. Correlation research design was adopted for the study. A sample of three hundred and forty-seven (347) respondents was randomly selected for the study. The selection was done through the stratified and simple random sampling technique. An instrument tag: Women Participation in Non-Governmental Organizations Environmental Awareness and Sustainable Water Resource Management Questionnaire (WPNGOSEASWRMQ) was the main instrument used for data collection. The instrument was faced validated by an expert in Measurement and Evaluation. The reliability estimate of the instrument was established through the Cronbach's coefficient alpha reliability method. Pearson Product Moment Correlation analysis was employed to test the hypothesis. The result of the analysis revealed that women participation in NGOs' environmental awareness significantly relate with water resources management. Based on the findings of the study, it was recommended that women in NGOs should be directly involved in water resource management that are sustainable and environmental friendly.

Keywords: Women, Participation, Environmental, Awareness, Sustainable, Water, Resources.

Introduction

Women participation in Non-Governmental Organizations (NGOs) is known to be related with local and international organizations such as the United Nations and World Health Organization. Their activities of NGOs comprise “information dissemination, awareness raising, development of education policy advocacy, joint operational projects, and providing technical expertise and collaborating with government agencies, programmes and funds. Through women’s participation, NGOs have gained popularity in some nations like Chile through initiatives to conserve water, such as establishing forest reserves and through the mobilisation of indigenous organisations and development so as to enhance a better standard of living through provision of portable water in harmony with the natural world environment.”

Some of the notable international events that facilitated dialogue aimed at conceptualizing effective environmental resource management include, the United Nations Conference, also known as the Stockholm Conference held in 1972 in Stockholm, Sweden. Over 1,200 representatives from 114 nations were in attendance. The report of this conference gave rise to the formulation of the United Nations Environmental Programmes (UNEP), saddled with the responsibility to “promote international cooperation in environmental matters.” Its tasks included “constant surveillance of the environment through a programme known as Earth watch, analysis of trends, the collection and dissemination of information,” the adoption of environmentally sound policies, and the adaptation of environmental protection projects to fit the needs and priorities of developing countries. UNEP has initiated projects in water system and other areas like the ozone layer, climate, the transport and disposal of waste, the marine environment, soil degradation, deforestation, biodiversity, urban environment, sustainable development, energy conservation, human settlements and population issues, health, toxic chemicals, environmental law, and education.

Another international conference was the Kyoto Conference in Mexico, with the theme: “Pattern of resource use, environment and development strategies” (Howard, 2009). This particular conference stressed the need for “basic needs” of members to be met and the development of the world conservation strategies. “The world conservation strategy called for development that is sustained by conservation sustainable development” (Graham, 2008).

In view of achieving effective water resource management initiatives through NGOs’ environmental awareness policies, “some critics ignore the efficacy of understanding the deep ecological knowledge embedded in women consciousness in relation to sustainability. Moreover, all women are at the centre of concern for sustainable development, and are entitled to a healthy and productive life in line with nature and

their access to the natural environment. This is particularly in relation to the resource that they use “to provide portable water, food, shelter, health maintenance, and income” and the well-being of their husbands and children, who typically benefit from the use and cash value of women environmental activities, all of which have been undermined.

Water is an essential resource for all life on the planet; of the water resource on earth, only three percent of it is fresh. Water resources are sources of water that are useful or potentially useful. Uses of water include agricultural, industrial, household, recreational and environmental activities. Virtually all of these human uses require fresh water. 97% of the water on the Earth is salt water. However, only three percent is fresh water; slightly over two thirds of this is frozen in glaciers and Polaris. The remaining unfrozen fresh water is found mainly as groundwater, with only a small fraction present above ground or in the air” (GreenFacts, 2008).

According to Simon (2008), “water that is collected beneath the ground is called groundwater. Worldwide, groundwater is 40 times more abundant than fresh water in streams and lakes. In Nigeria, approximately half the drinking water comes from groundwater.” “Although groundwater is a renewable resource, reserves replenish relatively slowly. Presently, groundwater is withdrawn approximately four times faster than it is naturally replaced” (Akpadio, 2007). Most huge underground reservoir both in Europe and Africa, are drawn at rates exceeding 100 times the replacement rate with respect to the normal rate.

Fresh water as a resource is renewable and its supply worldwide is decreasing on daily bases. The demand for water is on the increase and exceeding its supply in almost all the nations of the world. The increase in demand is as a result of population explosion. Women active participation in NGOs’ “awareness of the global importance of preserving water for ecosystem services has only recently emerged as, during the 20th century, more than half the world’s wetlands have been lost along with their valuable environmental services for Water Education” (Molden, 2007).

In addition to groundwater exhaustion, scientists worry about groundwater impurity, which arises from leaking of underground storage tanks, poor industrial waste ponds, and seepage from the deep-well injection of hazardous wastes into underground geologic formations. By some estimates, on average, 25 percent of usable groundwater is contaminated, and in some areas as much as 75 percent is contaminated. The global supply of freshwater is also distributed unevenly. Chronic water shortages exist in most of Africa and drought is common over much of the globe. The sources of most freshwater supplies, including groundwater (water located below the soil surface), reservoirs, and rivers are under severe and increasing environmental stress because of

overuse, water pollution, and ecosystem degradation. Over 95 percent of urban sewage in developing countries is discharged untreated into surface waters such as rivers and harbors" (Chartres & Varma, 2010).

According to Wolf (2001)

about 65 percent of the global freshwater supply is used in agriculture and 25 percent is used in industry. Freshwater conservation therefore requires a reduction in wasteful practices like inefficient irrigation, reforms in agriculture and industry, and strict pollution controls worldwide. In addition, water supplies can be increased through effective management of *watersheds* (areas that drain into one shared waterway). By restoring natural vegetation to forests or fields, communities can increase the storage and filtering capacity of these watersheds and minimize wasteful flooding and erosion. Restoration and protection of wetlands is crucial to water conservation. Like giant sponges, wetlands stabilize groundwater supplies by holding rainfall and discharging the water slowly, acting as natural flood-control reservoirs.

Many people treat water resources with more ambivalent; while the "informal and community-based water resources management is strong at community levels" where women participation on awareness can make the management of this resource even stronger to achieve a sustained fresh water usage and non-contamination with waste. According to Sullivan (2002), women NGOs together with government agencies should encourage a water-oriented society through adoption of the three "E Pillars" that support the framework of water resources management. To them, the three "E Pillars" include: "Social Equity, Sustainable Environment and Economic Efficiency. While Social Equity refers to the basic right for all people to have access to water of adequate quantity and quality for the sustenance of human well-being, sustainable environment implies that the present use of water resources should be managed in such a way that does not undermine the life support system, thereby compromising use of the same resource by future generations. Economic Efficiency means that because of the increasing scarcity of water and financial resources, the finite and vulnerable nature of water as a resource and the demands on it, water must be used with maximum possible efficiency".

Apparently the role of women in NGOs on water resource management was also supported by The UN Conference on Environment and Development, in Rio de Janeiro, 1992, which had 172 national governments in attendance, including many AU member countries. The conference endorsed the report of the Conference on Water and the Environment, held in Dublin in January 1992. The "Dublin Principles" have played a significant role in stimulating reforms in water management and has also

played a key role in International Water Resource Management (IWRM). The conference report sets recommendations for action at local, national, and international levels based on the following four principles with many associated key concepts:

- i. Fresh water is a finite and vulnerable resource, essential to sustain life, development, and the environment.
- ii. Water development and management should be based on a participatory approach, involving users, planners, and policy makers at all levels.
- iii. Women play a central part in the provision, management, and safeguarding of water.
- iv. Water has an economic value in all its competing uses and should be recognized as an economic good.

The Department of Geology, Mines and Water Resources (2008) opines that portable water resources are best managed by women since Africa, Asia and the Pacific have widely acknowledged and adopted community-based management (CBM) for water management. The infrastructure for water supply is generally constructed by government, civil society, and non-governmental organizations and then handed over to the community, to be managed by a water user committee (WUC). To ensure service provision, the WUC is expected to collect user fees and oversee the operation and maintenance of the system.

The Vanuatu National Water Strategy supports a CBM for water supply (Department of Geology, Mines & Water Resources, 2008). The majority of rural households have access to an improved water source (88 per cent), 30 per cent is piped into the dwelling, 44 per cent is rainwater, and the remaining 14 per cent is ‘other improved’. Water collection has traditionally been a task for women and children, particularly when sources are far from villages (Department of Geology, Mines & Water Resources, 2008). This is supported by data from the 2007 Multiple Indicator Cluster Survey which found that women do 65 per cent of water fetching (Vanuatu Ministry of Health, 2007). The National Water Strategy promotes the involvement of women in local water, including in planning for and managing the resource, but there is no mandated target for female participation (Department of Geology, Mines & Water Resources, 2008).

As a result of social norms, decision-makers in water policy and management worldwide have usually been women having limited influence (Michael, 1998; United Nations Department of Economic and Social Affairs, 2005; Ray, 2007; Fisher, 2008; Acey, 2010; Kilsby, 2012; Carrard *et al.*, 2013; Peacock, 2015). Female membership of WUCs can provide a proxy measure for women’s involvement in water management. However, WUC membership does not guarantee women’s active involvement in decision-making (Kilsby, 2012; World Health Organization, 2012).

Even when national policies and affirmative action support women's participation in water management, there are often obstacles to their meaningful rather than tokenistic representation (Kilsby, 2012; World Health Organization, 2012). Assessing whether women hold key posts in the committee may provide a better indication on their level of participation in decision-making.

It is generally assumed that, since women are the main beneficiaries of water service delivery, they have a vested interest in its success, and their involvement in management decision-making will lead to better performance. By improving the participation of women in water management, including in key posts, it is believed that water programmes and policies will be more efficient and effective (United Nations Department of Economic and Social Affairs, 2005; Fisher, 2006, 2008; Carrard *et al.*, 2013). While there has been no systematic review on the subject, studies from Africa, Asia, and Latin America appear to support this hypothesis (van Wijk-Sijbesma, 2001; Foster, 2013; Whalen and Belo, 2013). It is also reported that women's involvement in water management enables them to develop confidence, self-reliance, and leadership skills and to gain more power and respect in the community (United Nations Department of Economic and Social Affairs, 2005; Fisher, 2006; Aladuwaka & Momsen, 2010; Kilsby, 2012; Carrard *et al.*, 2013). Changes in attitudes regarding traditional mores, respectful relationships between women and resources management and reductions in family conflict and violence against women have also been reported (Willetts *et al.*, 2009; Kilsby, 2012; Carrard *et al.*, 2013). The following analysis sought to better understand women's roles in water management, the level of women's participation, and any impact on WUC and water system functioning.

Research question

Does women's participation in NGOs environmental awareness relate with water resource management in Cross River State?

Hypothesis

Ho1: Women participation in NGOs' environmental awareness is not significantly related to water resource management in Cross River State.

Methodology

Correlation research design was adopted for this study because it deals with a general method of research that focuses on "assessing the co-variation among naturally occurring variables". It plays a major role in "exploring quantitative research in terms of exploring the nature of the relations among a collection of variables. This design is conducted when researchers want to explore the extents to which two or more variables co-vary that is, where changes in one variable are reflected in the others". The population of the study comprises all registered women in non-governmental

organizations (NGOs) that have environmental resource management background. In all, the total population for the study was about 2617. This comprises 758 women in non-governmental organizations (NGOs) from Northern senatorial district; 801 from Central senatorial district, and 1058 from Southern senatorial district. The researcher used stratified sampling techniques to select the sample from the study population. The stratified technique delineates the population into three strata using three senatorial districts: North, Central and South senatorial districts. In each senatorial district, two (2) Local Government Areas were selected through the use of simple random sampling technique. Altogether twelve (12) communities were used as the population, from which the respondents are drawn. A total of 347 respondents were selected.

A research instrument tag: Women Participation in Non-Governmental Organizations Environmental Awareness and Sustainable Water Resource Management Questionnaire (WPNGOSEAWMQ) was used to obtain information from the respondents. It was divided into two parts. The first part of the questionanire focuses on gathering information about the demographic characteristics of respondents. The second part of the questionnaire was a four-point Likert scale. Respondents were expected to indicate their choices by ticking one of these options. The validity of this instrument was ascertained by three experts in Meaurement and Evaluation from the University of Calabar. The experts were asked to assess the relevance of each items in relation to the objectives of the study and the hypothesis tested as well as the comprehensibility of each item in relation to the cognitive level of the respondents. The Cronbach Alpha reliability method was used to determine the reliability of the instruments. The reliability was found to be 0.78. The questionnaire was the major instrument for data collection. Copies of the questionnaire were administered in each of the sampled area in Cross River State. The respondents were informed of the exercise and the essence of giving objective responses to the items. They were also told to be honest in their responses to the items as the information obtained would be treated with all amount of confidentiality and be used as data for the research only. At the end of the exercise, three hundred and forty-seven (347) copies of the questionnaire were successfully completed and retrieved from the sampled area. Pearson Product Moment Correlation was used in data analysis.

Presentation of results

H_{o1}: Women participation in NGOs' environmental awareness is not significantly related to water resource management in Cross River State.

The dependent variable in this hypothesis is Water resources management in Cross River State, while the independent variable is women participation in NGOs'

environmental awareness. Pearson Product Moment Correlation analysis was employed to test this hypothesis. The result of the analysis is presented in Table 1.

Table 1: Pearson Product Moment Correlation analysis of the relationship between women participation in NGOs' environmental awareness and Water resources management in Cross River State (N=347)

Variables	Mean	SD	ΣX	ΣX^2	ΣXY	R
			ΣY	ΣY^2		
Environmental awareness	16.13	2.19	5597	15461		
Water resources management	18.80	1.19	6524	16824	158433	0.60*

*Significant at .05 level, critical r = .133, df = 345

The result in Table 1 reveals that the calculated r-value of 0.60 is higher than the critical r-value of .133 at .05 level of significance with 345 degree of freedom. With this result the null hypothesis was rejected. This result therefore means that Water resource management in Cross River State has a significant relationship with women participation in NGO's environmental awareness.

Discussion of findings

This section is primarily concerned with the discussion of findings that emerged from the results of the analysis. The result of this hypothesis indicated that Water resources management in Cross River State significantly relates to women participation in NGOs' environmental awareness. The finding of this study is in agreement with the view of Akpabio (2007), who argues that women participation on awareness can make the management of this resource even stronger to achieve sustainable fresh water usage and prevent contamination with waste. Sullivan (2002) adds that women NGOs together with government agencies should encourage a water-oriented society through adoption of the three "E Pillars" that support the framework of water resource management.

Conclusion

Based on the results of the study, it could be concluded that women's participation in NGOs' environmental awareness would revolutionize people's perceptions, attitudes, behaviours and values towards water resources and enhanced environmental sustainability.

Recommendations

On the basis of the findings of the study, the following recommendations were made:

- i. That women in NGOs and other relevant bodies should intensify their efforts to increase environmental awareness among Nigerians on how water resource can be managed properly using both formal and informal approaches. Also awareness raising and training of facilitators, among others, should be encouraged to ensure that all people, including government officials learn how best to take up the challenges of keeping the environmental resources sustainable.
- ii. Women should be involved in the establishment of conservation clubs in communities and schools in order to teach the children how water resources should be managed to avoid extinction of the marine resources. Such clubs should be established from primary to tertiary institutions and should be made mandatory for students.
- iii. Women in NGOs should work in collaboration with community dwellers, in order to empower them economically and socially to play more active role in the protection of environmental resources.
- iv. Women in NGOs should be directly involved in water resources management that are sustainable and environmental friendly.

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Women Participation in NGOs' Environmental Awareness and Water Resources Management Programmes in Cross River State, Nigeria
Agnes I. Ulayi, Ph.D & Sunday David Edinyang, Ph.D

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Ethnomathematics: A Reflection of Culture and Tradition

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Abstract

This paper x-rayed the field of ethnomathematics as a true reflection of culture. It considers ethnomathematical activities within the cultural diversity of the people. This is aimed at mirroring some cultures within the society in order to improve the culture and to see how it affects the educational system, especially the learning of mathematics. This subject matter was examined under the following headings: counting, the historicity of ancient mathematics, number symbolism and mysticism, the concept of time and record keeping, measurement, the Bakor experience. Ethnomathematics as a culture-based mathematics and a remedy to the problem posed by western mathematics within our school settings has been extensively discussed. It was concluded that ethnomathematical concepts help to improve the methods of teaching school mathematics; teachers of mathematics are therefore encouraged to incorporate the concepts in their teaching approaches.

Keywords: Ethnomathematics, Culture, Tradition

Introduction

The importance of mathematics cannot be over emphasized because of its usefulness to human and societal development. Learners of mathematics perceive mathematics to be an abstract and a dreaded subject. Not only that, they equally develop hatred for it owing to the fact that, it is perceived to be a difficult subject (Enukoha, Meremikwu & Ekweme, 2007). This misconception and notion held by learners of mathematics has given the teachers of mathematics great concern. In a quest to see how this misconception, as held by learners of mathematics, can be dispelled, scholars of mathematics came up with the concept of ethnomathematics, which is the integration of culturally acquired mathematical skills in the teaching and learning of school mathematics.

Ethnomathematics is the mathematics practiced by an identifiable cultural group (D'Ambrosio, 1997). It is also seen to be unwritten or oral literacy (Enukoha, 1979). Perhaps, this is aimed at relating the daily activities engaged in by students at home to